



Fire Protection Training

Procedures Handbook 4300

VEHICLE EXTRICATION

TOPIC: VEHICLE EXTRICATION – DISENTANGLEMENT

TIME FRAME: 2:00

LEVEL OF INSTRUCTION: Level II

BEHAVIORAL OBJECTIVE:

Condition: A written examination

Behavior: The student will list and describe common methods and procedures to disentangle victims prior to extrication

Standard: With a minimum of 70% accuracy, according to the information contained in this lesson plan

MATERIALS NEEDED:

- Appropriate visual aids
- Audio visual equipment

REFERENCES:

- Fire Service Rescue, IFSTA, 6th Edition
- Principles Of Extrication, IFSTA, 1st Edition
- Collision Rescue, Car Busters, Video

PREPARATION:

After gaining access, consideration must be given to determine if the victim is trapped. The most common items causing entanglement of the victim(s) are the dash, steering wheel, seat, or brake pedal. There are many tools and techniques available to move these objects, but generally it is true that the “simpler the better.”



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PRESENTATION	APPLICATION
<p>NOTE: Information Sheet #1</p> <p>I. MOVING BRAKE PEDAL</p> <p>A. Strap or chain method using the vehicle door as a lever</p> <ol style="list-style-type: none">1. Determine direction to be pulled2. Use a<ol style="list-style-type: none">a. 12' backboard strap, orb. Hose strap, orc. Short piece of rope, ord. Chaine. Other3. Secure pedal shaft by connecting near the end of the pedal4. Open door slightly and secure other end of strap to the door<ol style="list-style-type: none">a. Use door in direction of desired pullb. Wrap through window and around doorc. Near latch end of doord. Make sure strap is tight	<p>What items on your engine could be utilized to perform this method?</p> <p>What other alternative do you have beside using car door?</p>

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<ul style="list-style-type: none">e. May use digging bar in place of door5. With a firm, steady pressure, open the door<ul style="list-style-type: none">a. Check movement of pedalb. Until victim is free6. Considerations<ul style="list-style-type: none">a. The further out the lever (away from the pivot point) you attach to the load, the more travel you will get, but you will have less leverageb. The closer to the pivot point that the load is attached the less travel you will get, but you will have greater leverage7. For upward pull<ul style="list-style-type: none">a. Attach strap to pedalb. Pass other end through removed windshield openingc. Attach end to digging bard. Place cribbing on hoode. Use cribbing as pivot point for digging barf. Another option is to use a highlift jack with strap or chain against rocker panelB. Porto powers or power rescue spreader<ul style="list-style-type: none">1. Place spreader between pedal and floor<ul style="list-style-type: none">a. Make sure that spreader does not contact victim2. Open spreader	

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<ul style="list-style-type: none">a. Slowlyb. Only far enough to free victim <p>II. MOVING A SEAT</p> <p>A. Should only be done to an unoccupied seat</p> <ul style="list-style-type: none">1. If seat is occupied this is extremely hazardous to victims with spinal injuries <p>B. Prior to using tools</p> <ul style="list-style-type: none">1. Try to move seat with manual seat adjuster2. Electric seat may still work if battery still connected3. Determine if bolts holding seat to the floor can be removed4. Determine if working room can be more easily attained by moving steering wheel5. Avoid jerking of seat if seat is occupied <p>C. Come-Along</p> <ul style="list-style-type: none">1. Attach chain around seat<ul style="list-style-type: none">a. Make sure chain centers around the seat<ul style="list-style-type: none">(1) Even pull(2) Seat won't bind on runners	<p>What should be constantly monitored during disentanglement?</p>

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<ul style="list-style-type: none">b. Keep clear of victim2. Remove rear window<ul style="list-style-type: none">a. Protect victim and self from broken glassb. Wear goggles3. Wrap second chain to rear of vehicle<ul style="list-style-type: none">a. To vehicle frameb. At least two full wrapsc. Make sure not to cross over fuel tank4. Hook cable to chain around seat5. Free spool cable out<ul style="list-style-type: none">a. Reverse lever in lowering/backing off positionb. Hold main frame by sidesc. Release main frame pawl with thumbd. Pull come-along toward anchor chain, paying out cable<ul style="list-style-type: none">(1) Avoid pulling cable off drum without a load(2) Loose cable could cross and cause wedging on drum or damage when load is applied(3) Keep 3 wraps of cable on drume. Hook main frame hook to anchor chain	<p>What could happen if the cable becomes loose?</p>

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<ul style="list-style-type: none">6. Adjust chain to length7. Install handle8. Place cribbing to<ul style="list-style-type: none">a. Reduce sharp bendsb. Avoid binding main frame9. Place reverse lever in pulling/lifting position10. Start pulling operation<ul style="list-style-type: none">a. Maintain a straight pull if possibleD. Power rescue spreader or ram<ul style="list-style-type: none">1. Install spreader between seat frame and door jam<ul style="list-style-type: none">a. Jaws closed2. Open arms until they make firm contact with the door jamb and seat frame<ul style="list-style-type: none">a. Make sure victim is clear of spreading armsb. Victim should not be in seat3. Apply full spreading power, pushing seat backward<ul style="list-style-type: none">a. Others stabilize victim4. Option<ul style="list-style-type: none">a. Place spreader under seat between seat frame and trackb. Open spreader until arms make firm contact	

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<ul style="list-style-type: none">c. Apply full spreading power until seat is removed from seat trackd. <u>Do not</u> use this method with victim in seat <p>E. Winch</p> <ul style="list-style-type: none">1. Attach tow chain around seat<ul style="list-style-type: none">a. Make sure chain centers around the seat<ul style="list-style-type: none">(1) Even pull(2) Prevent bind on seat tracksb. Keep clear of victimc. Victim should be in Kendrick Extrication Device2. Remove rear window<ul style="list-style-type: none">a. Protect victim and self from broken glassb. Wear eye protection3. Butt fire engine against rear of the vehicle4. Attach the winch cable through the rear window to the tow chain around the seat5. Apply pulling power until seat is pulled back<ul style="list-style-type: none">a. Keep safety zone around winch cable clear <p>F. Air chisel</p> <ul style="list-style-type: none">1. Cut around bolts <p>G. Use socket/ratchet or wrench to unbolt</p>	

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<p>III. MOVING A STEERING WHEEL</p> <p>A. Cut parts away from steering wheel</p> <ol style="list-style-type: none">1. Do not attempt to pull a steering wheel of a front wheel drive vehicle2. Disconnecting the battery to prevent accidental air bag deployment does not work in many cases3. Skip this step if cutting steering wheel is not enough4. Cut spokes of wheel not the ring<ol style="list-style-type: none">a. Hydraulic cuttersb. Reciprocating sawc. Hacksaw with diamond blade (32 teeth per inch) <p>B. Winch</p> <ol style="list-style-type: none">1. Butt engine against the front of vehicle2. Remove wind shield or break hole<ol style="list-style-type: none">a. Protect persons inside by covering with blanket, turnout coat, fire shelterb. Locate hole in front of steering wheel3. Wrap chain around steering column<ol style="list-style-type: none">a. Use two wraps	<p>What must rescuers consider a potential hazard when working around steering columns?</p>

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<ul style="list-style-type: none"><ul style="list-style-type: none">b. Around lower end, near dashc. Wraps must be below tilt joint on tilt steering wheels<ul style="list-style-type: none">(1) Failure to do so may cause column to break and cause injury4. Place cribbing on dash near fire wall for support5. Pass end of chain over cribbing and out wind shield<ul style="list-style-type: none">a. Cribbing helps reduce amount of chain cutting into dash6. Attach winch cable to chain7. Apply pulling power<ul style="list-style-type: none">a. Slowly until steering column is raisedb. Keep clear of winch cable danger zoneC. Come-alongD. NOTE: Student Information #2<ul style="list-style-type: none">1. Wrap chain on steering column<ul style="list-style-type: none">a. Same as for winch2. Wrap second chain to front of vehicle<ul style="list-style-type: none">a. To frameb. At least one full wrap3. Hook cable to steering column chain4. Free spool cable out	



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<ul style="list-style-type: none">a. Reverse lever in lowering/backing off positionb. Hold main frame by sidesc. Release main frame pawl with thumbd. Pull come-along towards anchor chain, paying out cable<ul style="list-style-type: none">(1) Avoid pulling cable off drum without a load(2) Loose cable could cross and cause wedging on drum or damage when load appliede. Hook main frame hook to anchor chain <p>5. Adjust chain to length</p> <ul style="list-style-type: none">a. Using grab hooks <p>6. Install handle</p> <p>7. Place cribbing to</p> <ul style="list-style-type: none">a. Reduce sharp bends of cableb. Avoid binding main framec. Reduce cutting into dash <p>8. Place reverse lever in pulling/lifting position</p> <p>9. Start pulling operation</p> <ul style="list-style-type: none">a. Maintain a straight pull if possibleb. Check cable drum to avoid binding cable	<p>What does the cribbing do?</p>

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<ul style="list-style-type: none">(1) Damages cable(2) Stops come-along from working <p>E. High lift jack</p> <ul style="list-style-type: none">1. Wrap chain on steering column<ul style="list-style-type: none">a. Same as for winch2. Wrap second chain to front of vehicle<ul style="list-style-type: none">a. To frameb. At least one full wrapc. Can be done using one long chain3. Make small hole in windshield4. Pass chain through hole5. Connect two chain ends together6. Place cribbing under chain<ul style="list-style-type: none">a. Near front edge of hood to reduce chain digging in7. Place cribbing on hood near windshield8. Place jack on cribbing<ul style="list-style-type: none">a. Handle towards rear side of vehicle9. Operate jack (up)<ul style="list-style-type: none">a. Until approximately half-way up to allow for a better line of pull	<p>Can one long chain be utilized with high lift jack?</p>

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<p>10. Take up slack in chain</p> <ul style="list-style-type: none">a. Until it will just reach over jack <p>11. Operate jack</p> <ul style="list-style-type: none">a. Until steering column is moved as needed <p>NOTE: Information Sheet #3</p> <p>F. Power Rescue Spreader</p> <ol style="list-style-type: none">1. Wrap chain on column<ul style="list-style-type: none">a. Same as winch2. Place power rescue spreader on hood of car<ul style="list-style-type: none">a. Arms fully openedb. Grab hooks in placec. Use shackles or pins on tool arms based on manufacturer's recommendations3. Wrap anchor chain to front of vehicle<ul style="list-style-type: none">a. To frameb. At least one full wrap4. Attach chains to grab hooks<ul style="list-style-type: none">a. Loose ends of the chains should pass up through the grab hooks5. Apply full pulling power to raise steering column<ul style="list-style-type: none">a. If necessary, open arms and reconnect chain and continue until steering column is clear of victim	

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<p>IV. MOVING DASH</p> <p>NOTE: Information Sheet #4</p> <p>A. Hydraulic Ram</p> <ol style="list-style-type: none">1. With the driver's door open, cut the "A" pillar just above the dash2. Make a second pie shaped cut on the same pillar above the floor board and below the bottom hinge3. Connect the proper size hydraulic arm to the hydraulic hose according to the manufacturer's instructions4. Place the butt end of the ram on a secure point on the floor<ol style="list-style-type: none">a. May need to place cribbing or rocker panel bracket under ram to provide solid contact point5. Place the tip of the ram in the area of the top hinge for strength<ol style="list-style-type: none">a. Extra metal in this area prevents the tip of the ram from tearing a hole in the metal6. Extend the ram, pushing the door and steering column up and towards the front of the vehicle <p>V. IMPALED VICTIMS</p> <p>A. Dress and bandage the wound around the impaled object</p> <ol style="list-style-type: none">1. Secure and immobilize <p>B. Cut or pry object loose from vehicle</p>	

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<ul style="list-style-type: none">1. Use hand tools rather than power tools whenever possible<ul style="list-style-type: none">a. Less vibration and forceC. Remove victim with object in place<ul style="list-style-type: none">1. Only physicians should remove impaling objects	<p>Why are hand tools recommended?</p>

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SUMMARY:

Remember, the primary objective of disentanglement is to safely free victims from the vehicle. This can most often be done by simple procedures in a minimum of time, to keep your skills at a proficient level, continue to practice them.

EVALUATION:

A written examination.

ASSIGNMENT:

To be determined by instructor(s).